

## BIOGRAPHICAL SKETCH

NAME Shelly D. Kelly	POSITION TITLE Assistant Physicist
eRA COMMONS USER NAME	

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
University of Idaho University of Washington	B.S. Ph.D	1992 1999	Physics Physics

### Positions and Honors:

#### ARGONNE NATIONAL LABORATORY

BioScience Division

Title: Assistant Physicist 2003-present

Title: Postdoctoral Appointee 1999-2003

Responsibilities include: 1) X-ray absorption spectroscopy measurements of contaminant metals and radionuclides in soils and sediments within biogeochemical systems. 2) X-ray microscopy studies of metal contaminants in geomicrobial systems. 3) Software and hardware design and development for analysis and collection of data. 4) Teach XAFS analysis and data collection techniques to other scientists and students.

#### UOP LLC

Title: EXAFS Consultant 2002-present

X-ray absorption spectroscopy analysis of catalysis and new materials that are being developed for new catalytic processes. Instructor for weekly classes on XAFS analysis to other scientists.

#### UNIVERSITY OF WASHINGTON 1999-2000

Physics Department

Title: Consultant

Responsibilities include: Designed and developed XAFS analysis software for the refinement of XAFS data using crystallographic information. Commercial software is distributed with the UWXAFS analysis package.

#### UNIVERSITY OF WASHINGTON 1992-1999

Physics Department

Title: Research Associate

Responsibilities include: 1) Collected x-ray absorption data at Stanford Linear Accelerator and Brookhaven National Laboratory. 2) Designed and developed a low-temperature high-pressure cell for XAFS data collection to study intermediate high-pressure phases of AgCl and AgBr. Discovered a topological transition mechanism for these systems. 3) Investigated the transition mechanism of RbCl. Developed analysis software for multiple data sets and provided critical results, indicating a martensitic-like transition mechanism.

Advisor: Professor R. Ingalls and Professor E. Stern

### Selected peer-reviewed publications

Kemner K. M. and **Kelly** S. D. Synchrotron-based techniques for monitoring metal transformation. In *Manual of Environmental Microbiology*. (in press 2006)

**S.D. Kelly**, E.T. Rasbury, S. Chattopadhyay, A. J. Kropf, and K.M. Kemner, "Evidence of a Stable uranyl site in Ancient Organic-Rich Calcite", *Environ. Sci. Technol.* 40, 2262-2268 2006.

Kemner, K. M.;O'Loughlin, E. J.;**Kelly**, S. D.;Boynov, M. I. "Synchrotron x-ray investigations of mineral-microbe-metal interactions and their effects on metal transformations", *Elements*, 1, 217-221 (2005)

- Suzuki, Y.; **Kelly, S. D.**; Kemner, K. M.; Banfield, J. F. Direct microbial reduction and subsequent preservation of uranium in natural near-surface sediment. *Applied and Environmental Microbiology* **2005**, *71*, 1790-1797.
- B.H. Jeon, S.D. Kelly, K.M.Kemner, M.O. Barnet, W.D. Burgos, B.A. Dempsey, E.E. Roden, "Microbial reduction of U(VI) at the solid-water interface," *Environ. Sci. Technol.* **38**, 5649-5655 2004.
- K.M. Kemner, S.D. **Kelly**, B. Lai, J. Maser, E.J. O'Loughlin, D. Sholto-Douglas, Z. Cai, M.A. Schneegurt, C.F. Kulpa, K.H. Nealson,, "Elemental and Redox Analysis of Single Bacterial Cells by X-ray Microbeam Analysis", *Science* **306**, 686, October 2004
- Y. Suzuki, S. D. Kelly, K.M. Kemner, J. F. Banfield, "Enzymatic U(VI) reduction by Desulfosporosinus species", *Radiochim. Acta* **92**, 11-16, Jan. (2004).
- M.I. Boyanov, S.D. **Kelly**, K.M. Kemner, B.A. Bunker, J.B. Fein, D.A. Fowle, "Adsorption of Cadmium to B. subtilis Bacterial Cell Walls: a pH-Dependent XAFS Spectroscopy Study," *Geochem. Cosmo. Acta.*, **67**, 3299-3311, Sept 2003.
- S.D. **Kelly**, M. Newville, L. Cheng, K.M. Kemner, S. Sutton, P. Fenter, N.C. Sturchio, C. Spotl, "Uranyl in calcite," *Environ. Sci. Technol.*, **37**(7), pg 1284-1287, April 2003.
- S.C. Brooks, J.K. Fredrickson, S.L. Carroll, D.W. Kennedy, J.M. Zachara, A.E. Plymale, S. Fendorf, K.M. Kemner, and S.D. **Kelly**, "Inhibition of Bacterial U(VI) Reduction by Calcium," *Environ. Sci. Technol.*, **37**, 1850-1858, 2003.
- Y. Suzuki, S. D. **Kelly**, K. M. Kemner, J. F. Banfield, "Microbial Population Stimulated for Hexavalent Uranium Reduction in Uranium Mine Sediment," *Applied and Environmental Microbiology*, **69**(3), 1337-1346, Mar. 2003.
- E.J. O'Loughlin, S.D. **Kelly**, R.E. Cook, R. Csencsits, K.M. Kemner, "Reduction of uranium(VI) by mixed iron(II)/iron(III) hydroxide (green rust): formation of UO<sub>2</sub> nanoparticles," *Environ. Sci. Technol.*, **37**, 721-727, Feb. 2003.
- S. D. **Kelly**, K. M. Kemner, J. B. Fein, D. A. Fowle, M. I. Boyanov, B. A. Bunker, N. Yee, "X-ray absorption fine-structure determination of pH dependent U-bacterial cell wall interactions", *Geochem. Cosmo. Acta*, **66**(22) 3875-3891, Nov 2002.
- Y. Suzuki, S. D. **Kelly**, K. M. Kemner, J. F. Banfield, "Nanometre-size products of uranium bioreduction," *Nature*, **419**(6903) 134, Sep 2002.
- J. G. Lack, S. K. Chaudhuri, S. D. **Kelly**, K. M. Kemner, S. M. O'Connor, J.D. Coates, "Immobilization of Radionuclides and Heavy Metals through Anaerobic Bio-Oxidation of Fe(II)", *Applied and Environmental Microbiology*, **68**(6) 2704-2710, 2002.
- M. Labrenz, G. K. Druschel, T. Thomsen-Ebert, B. Gilbert, S. A. Welch, K. M. Kemner, G. A. Logan, R. E. Summons, G. De Stasio, P. L. Bond, B. Lai, S. D. **Kelly**, J. F. Banfield, "Sphalerite (ZnS) deposits forming in natural biofilms of sulfate reducing bacteria," *Science* **290** 1744-1747, 2000.
- A. I. Tsapin, M. G. Goldfeld, G. D. McDonald, K. H. Nealson, B. Moskovitz, P. Solheid, K. M. Kemner, S. D. **Kelly**, K. A. Orlandini, "Iron(VI): Hypothetical Candidate for the Martian Oxidant," *Icarus* **147** 68-78, 2000.